DOCUMENT RESUME

ED 100 779 SO 008 070

AUTHOR	Giordano, Steve; Ellis, Paul
TITLE	Applications of Media for Environmental Education in the School. Project Report No. 12.
INSTITUTION	Western Washington State Coll., Bellingham. Huxley Coll. of Environmental Studies.
SPONS AGENCY	National Center for Educational Research and Development (DHEW/OE), Washington, D.C.
PUB DATE	71
NOTE	45p.; This report is part of the ongoing Sedro-Woolley Project; see final report ED 066 363
EDRS PRICE	MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS	Audiovisual Aids; Curriculum Development; *Ecology; *Environmental Education; Grade 8; Group Activities; Interdisciplinary Approach; *Learning Activities; *Multimedia Instruction; School Community Relationship; Secondary Education; *Student Developed Materials
IDENTIFIERS	*Sedro Woolley Project

ABSTRACT

The creation and use of school-made audiovisual teaching aids that emphasize ecological principles are presented to help secondary students and teachers develop curriculum in environmental education. The specific resources include motion pictures, photographs, videotape, sound recordings, and multimedia presentations. The main emphasis of the paper is on the cooperative production of these materials by students and teachers together, and the use of them to foster personal and environmental perception. After producing visual and sound presentations, students are aware of controls they can exert over certain aspects of their environment and simultaneously become part of the technological revolution. The materials developed offer a multidisciplinary approach to environmental education and can benefit and be of interest to the rest of the school population and the community. The interpretation and evaluation of the developed materials allow students to decide the environmental issues themselves in the face of the overwhelming barrage of contradictory information. A bibliography of resources available for the creation of classroom, developed audiovisual materials is included. (Author/JR)

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APPLICATIONS OF MEDIA FOR ENVIRONMENTAL EDUCATION IN THE SCHOOL

Steve Giordano
Paul Ellis

Sedro-Woolley Project Report No. 12
December 1971
U.S.O.E. Project No. 0-0848
Grant No. OEG-0-70-5039

Huxley College of Environmental Studies
A Division of Western Washington State College
Bellingham, Washington 98225

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The research reported herein was performed pursuant to a grant with the U.S. Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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HUXLEY COLLEGE
Environmental Education Center

APPLICATIONS OF MEDIA FOR ENVIRONMENTAL EDUCATION IN THE SCHOOL

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TO THE TEACHER:

Presented here are ideas for multidisciplinary environmental education. The objectives of the ideas and methods suggested are clearly stated. The overall objective is to provide you, the teacher, with an aid in the development of your approach to teaching for and about the environment. These are not learning packages designed to be applied verbatim, but suggestions for ideas and methods that will enable you to develop learning packages. The contents of this report represent only the first treatment of the idea. It is published in this form in order that teachers may have an opportunity to experiment with it.

You will have to design your personal approach to environmental education. You are an environmental educator now, whether you realize it or not, because the environment is all around you and you are teaching about the environment that surrounds both you and your students. The state of the environment indicates that there is something wrong with the way in which you have learned to perceive and behave relative to the environment, and with the way you are teaching others to learn and behave in their environment today.

The ideas presented here are examples of ways in which you can incorporate environmentally beneficial learnings into your curriculum. The intent is not that you "add on" something specifically environmental to your curriculum, but that you incorporate environmental learnings into your treatments of the subject matter with which you have already been dealing. The specific manner in which you treat your responsibility to

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educate for environmental stewardship is up to you. It is hoped that these and many other ideas will help you in your effort to understand the meaning of "environmental education" and its implications for you as a teacher and as a human organism.

The environmental education development project of which this report is a part is an ongoing one, and it is hoped that all who attempt to use the report will participate in the project by reporting the results of their efforts to the project staff. The staff will compile the ideas and methods collected. This will enable all working on the development of environmental education to share each other's work and will promote the spirit of cooperation essential to the success of any project as broad as this one.

Please report the methods and results derived from your use of this report to:

John Miles, Director
Environmental Education Project
Huxley College of Environmental
Studies
Bellingham, Washington 98225

Thank you.

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I. CLASSROOM-MADE AUDIO-VISUAL MATERIALS FOR ENVIRONMENTAL EDUCATION

Steve Giordano

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I. CLASSROOM-MADE AUDIO-VISUAL MATERIALS FOR ENVIRONMENTAL EDUCATION

INTRODUCTION

This paper will discuss the creation and use of school-made audio-visual teaching aids, emphasizing their application to ecological principles. The specific resources dealt with include: motion pictures, photographs, videotape, sound recordings, and multimedia presentations.

The main emphasis in the paper will be on the cooperative production of these materials by students and teachers together, and in each section there will be discussion of how the materials might be used in such a way as to foster personal and environmental perception. Specific examples will be given, as will general directions the class might take.

Creating media aids is a lot simpler than is commonly thought, and the undertaking itself provides an exceptional learning experience, especially when done by a cooperative group. The more children are involved in a learning situation, the more they will learn; hence, the more responsibility for their education they should be given. Students retain ten per cent of what they read, twenty per cent of what they see, and fifty per cent of what they see and hear. The percentage increases as the students' degree of participation in the experience increases.

Cooperation is something not generally dealt with in the schools, yet it is of prime ecological importance. Also, technological implications

should be considered: television and movies have helped create a mass passive audience. By producing visual and sound presentations, students become aware of controls they can exert over certain aspects of their environment, and simultaneously become part of the technological revolution. Such involvement and experience can only heighten the students' awareness of the world in which they live.

Aside from the benefits of making classroom materials, the materials themselves have a high usage value; because they are locally-made they will voice ideas and subjects not commercially available, and because we learn about the interpretation of media through the process of making it, students are pushed into taking defensible positions on vital issues. All audio-visual work involves editorializing and viewpoint. Interpreting and evaluating are important functions of education, especially environmental education; we must decide the issues for ourselves in the face of an overwhelming barrage of contradictory information. Material growing out of students' real concerns about local issues will be of great interest to the rest of the school population and the community.

It is assumed that the teacher is committed to environmental education and that a multidisciplinary approach is honored. If properly done, classroom-produced audio-visual materials will do much to foster realistic perceptions of ourselves and the world around us.

MOVIE PRODUCTION

The Super-8 motion picture camera is basically a device for recording a series of still pictures at eighteen frames per second.

In viewing a film the illusion of motion is possible because images remain on the retina of the eye for 1/50th to 1/30th of a second, and each new frame of film is visible sooner than that. Each frame is in the projector gate for 1/18th of a second, but is projected three times by means of a rotating aperture that interrupts the light beam. So each image we see is on the screen for 1/54th of a second.

Most likely, classroom film work will be done with Super-8 cameras. Super-8 is a very versatile format, being used for everything from home movies to television news reporting. Most of these cameras have many automatic features--light exposure meter, diaphragm, battery power, etc.--and the filmmaker is free to concentrate on the content to be recorded. Some desirable features for classroom camera work are:

- behind-the-lens reflex viewfinding system (essential for keeping track of focus and composition)
- single-frame button, enabling the filmmaker to expose one frame at a time (used in animation and some special effects)
- battery check meter
- zoom lens

In buying any audio-visual equipment, points to be considered are ease of operation, quality of reproduction, and ease and speed of repairing.

Prices vary widely for Super-8 equipment. A camera can cost as little as $30, or as much as $1500. As with anything else, the decision depends on the purchaser's means and ambitions. The teacher interested in purchasing camera equipment should research the matter very thoroughly. It is wise to talk with filmmakers, both amateur and professional, before a decision as to equipment purchase is made. Qualities of equipment

that should be considered were mentioned above. Price lists for Super-8 cameras and accessories are available in most camera shops.

A simple combination for teachers and students to use is the automatic camera with zoom lens and cartridge projector. The cartridge contains a loop of film up to five minutes in length that rewinds itself automatically and needs no maintenance.

The question of whether or not a film should have a sound track is one that should be decided at the outset. Sound is not necessary to achieve a good film--many good teaching films are silent. Lecture films would often be better left undone, but if a film's narration can be inherently related to and augment the visual content in a non-intruding way, it should be included. Music does much to determine the emotional content of a film. It can be used to heighten and reinforce the visual element, or it can contrast and create conflict in the viewer. For example, heavy classical music in conjunction with a shot of belching smokestacks might create an ominous, threatening feeling in the viewer, whereas light jazz would tend to smooth over such feeling. Indeed, light music is very often used on television to cover scenes of violence.

Sound tracks can be recorded either at the time of filming, thus incorporating live voices and sound effects, or it can be done later, utilizing narration, music, and special effects. Ordinary tape recorders do the job quite well, or, if enough money is available, some camera manufacturers offer camera-recorder-projector systems for easy synchronous filming and viewing. In either case

laboratories apply a thin magnetic stripe to the film after shooting, and to this is transferred the sound from the cassette or standard recorder.

A great percentage of films are done in color, but some thought might be given to using black and white film. It is cheaper, for one thing, and offers certain artistic advantages. Color is sometimes a diversion in itself; the filmmaker can more easily direct the viewer's attention in black and white by, for example, committing bright distracting background objects to a place on the grey scale.

EXECUTING A FILM

The first step in making a film, obviously, is to select a subject or theme. Appropriate topics to document might be:

- Portraying some local environment for study, such as the classroom itself, the school, the neighborhood, one's home, the downtown area, an industrial section, parks or woods.
- Documenting a local problem of some sort, such as city planning, pollution of a stream within the community, or encroachment of roads on parkland. Such a subject requires study and good reporting and might produce an end-product of value to the community.
- Documenting a recycling program, perhaps including a filming field trip to a recycling plant to show the industrial processes involved.
- Filming an in-depth study of a person, including interviews and scenes of that person at work or play. (Perhaps a school official could be the subject, in the hope of fostering better understanding between the administrators and the administered.) An interesting project might be for the subject of the film to script and direct one version, and for the students to do another.
- Documenting the natural resources of the local region.
- Investigating the life processes of local marine, plant, and animal life, perhaps with an eye to how man relates to the given subject.

Once the subject matter of the film has been decided upon, the script should be written in as complete a version as possible. A popular format is to write in two columns; one for narration and dialogue, the other for camera direction and sound effects (Figure 1). This format can be easily broken down into individual scenes to be filmed (Figures 2 and 3). In selecting shots, be certain that there is a good reason for including each one and that one follows the other in a coherent fashion. In scripting and filming, the most important rule is to keep the viewer and his lack of familiarity with the subject matter in mind at all times.

The animation film is a type that should be strongly considered. The images to be recorded on film are more easily controlled and this type of project allows a greater degree of group participation. Working with animation more easily lends itself to the time slots available in public schools; production can be left at any stage of development and returned to later, even on another day, with no loss of set-up time or character build-up.

The animated film is a direct, concrete method of filmmaking with a high degree of individual control. It is a film form wherein it is possible to express subtleties, ambiguities, and complexities which do not lend themselves well to verbal or other conventional forms of expression. Much of our physical and psychological world is increasingly abstract, nonverbal, and nonphotographable, and animation can easily show not only what things are, but what they mean.

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YEAGER'S SHOPPING CENTER
30 SECOND COMMERCIAL
FOR KVOS-TV, BELLINGHAM
NOVEMBER 10, 1971

PRODUCED BY
WESTERN WASHINGTON STATE COLLEGE
DEPT OF ECONOMICS AND BUSINESS
ADVERTISING CLASS BA 331
DR. FARROKH SAFAVI, INSTRUCTOR

E.T.*	A.T.*	VISUAL	AUDIO	
0	3	WIDE ANGLE OF "KINDERGARTEN" TEACHER AND HER CLASS 8 TO 10 CHILDREN) IN MOCK ETV STUDIO SET OF YEAGER'S TOY DEPARTMENT, SINGING AND DANCING A CHILDREN'S SONG	TEACHER & CLASS:	OPENING MUSICAL BARS OF "IF YOU'RE HAPPY": "IF YOU'RE HAPPY AND YOU KNOW IT...
3	2	BEGIN SLOW SIX SECOND ZOOM FROM WIDE ANGLE TO MCU OF TEACHER WHO TURNS TO FACE CAMERA HOLDING TWO CHILDREN	TEACHER & CLASS:	"CLAP YOUR HAND... CLAP...CLAP"
5	1	TEACHER TURNS, CONTINUE ZOOM	TEACHER:	EVERYBODY'S HAPPY HERE AT YEAGER'S BECAUSE....
9	4	DISSOLVE TO SPORTS DEPT INSIDE YEAGER'S (FILM TO BE SHOT ON LOCATION)		

*E.T. ELAPSED TIME
A.T. ACTUAL TIME

--MORE--

Figure 1. Example of filmscript page

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visual image						
camera direction	zoom in for tight closeup					
narration or soundtrack	"Bert, look at these weird things growing on the rock."					

Figure 2. A common form of "storyboard," a way of breaking down a story into an easy-to-handle series of images.

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Figure 3. Simplified "storyboard." This version might be more useful in a classroom situation than the form on the preceding page.

The material of animated films can be pliable three-dimensional objects (puppets, or objects constructed from such materials as clay, pipe cleaners, etc.); hard movable objects (pebbles, sand); photographs or drawings in series; or paper cutouts. The possibilities are limitless.

In making a film a person can have many objectives. Most pertinent here are the ones a teacher may have concerning a classroom of students. Learning must take place, and the teacher, perhaps with some student initiative, must decide how making a film might produce beneficial changes.

First, what will the act of putting a film together achieve? In terms of personal and environmental awareness, what will a person gain from the experience? It is essential to keep in mind here that the important element is the process. The real learning will take place with the process, rather than with the finished product.

The Process

1. Discussion and selection of topic; formation of objectives and points of view.
2. Research, including discovering how the topic has been treated by others.
3. Definition (including that in scripting) in a coherent way so all concerned can readily understand and proceed with related parts of the project.
4. Translation of these ideas and plans into film terms and film images that an audience can readily accept and comprehend.
5. Dealing with the technological skills necessary to achieve the objective.

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The Result

The audience will presumably have new knowledge, both of itself (perhaps individually, culturally and/or globally) and of its environment. Ways of acting upon this new knowledge may be shown, not necessarily in a blatant fashion.

VIDEOTAPE

Videotape recorders (VTRs) are now within the budget of most schools and, since the tape can be used over and over, cost very little to operate. (New tape costs about one dollar per minute.) Little technical skill is needed to operate VTR units, and, unlike film, one can view the results upon completion of any shot, complete with sound.

Videotape recorders are quite similar in operation to standard tape recorders. Both record on magnetic tape, a flexible polyester coated with magnetic oxide particles. The rearrangement of these particles produces the sound and visual images. (Tape size varies from quarter-inch to two inches. A particular size tape cannot be played on a machine made for a different size, nor on one of the same size made by a different manufacturer than the tape.)

Videotape recording is probably the most useful tool for encouraging self-awareness. A person's actions and sounds recorded on tape provide a mirror image; himself as he is seen by other people. The screen image of a person rarely corresponds with his self-concept, just as our voices sound strange to us on a tape recording. Recognizing this difference is the first step toward a realistic perception

of oneself. With proper evaluation, this kind of recording project can provide a powerful incentive toward constructive change in behavior. This has been proven time and again with the Far West Lab's Minicourse for teachers,* and there is no reason to withhold the same benefit for students.

Students themselves should be the prime users of VTR equipment. To get the greatest gain in sense of self, a student should be part of the process of which he is a subject.

Suggested Videotape Projects

1. Recording class or group activities using one crew at a time and evaluating how the individuals in the group relate to each other, i.e., cooperatively?
2. Recording, one at a time, different people performing the same activity.
3. Recording a lesson or experience to be played to the class at a later time. (A student, or anyone can for that matter do this project.)

The ways in which videotape equipment may be used will vary greatly with the grade level of the students and the subjects being taped. The equipment is quite expensive and care is necessary in its operation. One approach to classroom operation of equipment would be to train one or two teams of high school students in the operation of the equipment and to then make these teams available to teachers and students throughout the district. This same group might operate an audio recording center as well in which they could prepare sound tracks to augment the video recording. A sixth grade class may, for instance, wish to prepare a tape on a simulated public hearing that they are holding

*Far West Labs for Educational Research and Development, Claremont Hotel, Berkeley, California.

relative to the building of a road through the neighborhood park. The high school crew could come in and the older and younger students could work together planning how they might record the event. The older students would be helping the younger ones to learn and would be learning themselves, about the problems of recording the hearing and about the subject of the hearing itself. The later viewing of the tape would give all students involved an opportunity to review the subject under discussion.

Virtually all schools contain students interested in photography, electronics, education, and production of audio-visual presentations. Such individuals, if organized as suggested, can contribute to the functioning of the school program, increase their knowledge of their area of interest, and learn the content of many subject areas through their participation in the process of recording materials for and activities in that area. This "crew" idea could be utilized by Industrial Arts groups and by Language Arts students. Such crews might consist of students from both areas who would work together on tasks that students and teachers at lower grade levels identified for them.

The point here is that video taping is not necessarily an end in itself, a technical aid for presentation of content, but can be a significant tool in the process of educating many students, a means to many ends.

SOUND RECORDING

As in videotape recording, one of the greatest values of sound recording is in its use for expanded perception, both of self and surroundings. Lacking the visual recording of VTRs, one can concentrate on verbal and other sound messages.

Editing magnetic tape is a simple process. Sound material can be shortened, rearranged, and juxtaposed to suit any purpose. Tapes can be played at different speeds than those at which they were recorded for deeper elemental analysis.

Many families have cassette recorders, so materials to be used in class can be easily recorded by students at home and in the community.

Tape recordings can be used to measure personal growth by listening to tapes made at different times during the year. Historic events can be recreated on tape, plays and stories can be recorded, and hypothetical encounters (such as job interviews, discussions with famous people, etc.) can be set up. Exchanging tapes with people in other places can be valuable, both for the subject matter discussed and for the experience of dealing with other people one-dimensionally.

Suggested Projects

1. Recording sound to accompany visual presentations.
2. Reporting class activities for playback to interested persons or groups.
3. Recording interviews with classroom visitors.

4. Recording ambient sound from a variety of environments at different times of day and night to study the aural implications of our surroundings. One might compare the sounds of a residential street at dawn and dusk or contrast a crowded party and a quiet conversation. (How does what we hear determine what we feel?)

5. Recording stories of people who have lived in the community for decades; how their life has changed, or how life around them has changed.

6. Recording radio or TV programs, especially news, to use in class as a basis for discussion.

7. Using recorded music in the context of lessons in language arts, art, music appreciation, geography, history, and other areas to illustrate perceptions of the composers of the works listened to. Discuss, for instance, Anton Dvorak's New World Symphony in American Literature or American History and discuss what perceptions of the artist are present and what they reflect from the period.

The technical team approach mentioned in the discussion of videotaping lends itself well to sound taping as well. Generally, the quality of equipment in schools is low, reproductive quality having been sacrificed for durability. If, however, a group of technically-oriented high school students were in charge of operation and maintenance of the equipment, better equipment might be justified and equipment use in the following manner might occur.

Two fifth grade teachers engage their students in a long process of environmental observation, perception exercises, and creative writing. These teachers' learning objectives lie in the realm of language arts in this particular instance. The students collect their writings and bring them together in a 30-minute script, complete with appropriate music which they have programmed into the presentation. The script is prepared and the high school crew contacted through the Industrial Arts Department. A group of fifth graders journeys to the high school to

meet their technical assistants and these students all work together in the studio in production of the tape. The high school students explain the process and oversee tape production. The fifth graders program the records and narrate their writings. Their end product of all of this effort, the tape, is shared with schoolmates from various grade levels and with parents, if the students so desire. The district's finest sound system is utilized in the presentation, and the high school crew sees that it is properly operated and cared for. The production is entirely a product of student effort.

Such a program requires a tape recorder with sound-on-sound capability, a turntable, microphones, an amplifier, and a good set of speakers. A faculty member from the high school oversees the whole program.

MULTIMEDIA

The use of combinations of audio-visual aids together can create an exciting environment in its own right, and the production of such a complex program will involve a large group of students who must work cooperatively. A show involving film, slides, and sound all used simultaneously can treat a single topic or related topics in a variety of ways while compounding and reinforcing the impact.

But a well-designed multimedia presentation is more than the sum total of devices used; each must be mutually supportive in the creation of the new learning environment.

Perhaps the most exciting impact of a multimedia presentation is to combine projected images on a series of small screens, filling

all areas of peripheral vision. But the purpose of the presentation must be kept clearly in mind to insure that each element contributes to the purpose.

Multimedia efforts may be utilized in the same manner as described in discussion of video and audio taping. An example of the use of audio and visual media together is described by Ellis in the second part of this report. The media may be used to describe elements of environmental reality, to create ideals of environmental reality, or to convey specific facts and concepts about a particular aspect of the environment.

An important point to keep in mind is that the greater the student participation in the creation and development of any presentation, the higher the learning value of the presentation to the student. The activities of hearing and watching a presentation are passive. The process of creating and producing are active, involving the mind, the body, and hopefully the soul of the student. Thus, the more process there is, the better.

The use of slide-tape programs produced within a school district, is discussed in another report in this series, "The Role of the Library in Environmental Education," Sedro-Woolley Project Report #4, by Howard Armstrong. A photographer-librarian in the district with grant support, studied dimensions of the local environment, laid out the "story" that he wished to present, and photographed his subject with his 35 mm camera. He then selected appropriate slides, and narrated the script onto a tape, complete with instructions to the student on how to run the projectors and when to change the slides. All of the programs that he

developed are listed in Armstrong's report. A valuable dimension of Mann's work is its local focus. Student viewers can identify with the subject being presented because it is local and they are aware of the subject's existence. For example, the topography and geology of Mt. Baker, which the students in that area see daily in the distance, are presented in one program.

Mann produced another valuable learning tool utilizing his photographic medium.* He enlarged black and white photographs of various natural phenomena such as mountain cirques, wildflowers, trees, and river meanders to an 18" x 24" size and developed study questions relating to the photographs. Mann's work is esthetically excellent and adds greatly to the decor of any classroom. Teachers have shown considerable ingenuity in applying the prints to studies in natural science, geography, art, and creative writing. While Mann's prints primarily focus on natural objects of study, this method could be extended to the whole spectrum of observable phenomena, especially to man-produced phenomena such as buildings, highways, machines, and other objects.

Suggested Projects

Educational Media and the Teacher suggests the following possibilities to use in the planning of a multimedia presentation:

- Hold an overview shot or complete picture on one screen, such as a lab experiment arrangement, while moving to a series of detailed close-up pictures on the other.
- Show two pictures side by side for comparison, such as two works of art, each on a separate slide.

*Photography as a medium of environmental education is discussed in Sedro-Woolley Project Reports #7 and #8, "An Environmentally Related Program for the First Grade," by Angelyn K. Shafer, and "A Year-Long Environmental Project," by Gloria Abrahamson.

- Hold a title of a group classification on one screen, with a series of example pictures on the other screen, providing a sort of visual paragraphing.
- Show a line drawing or labeled schematic diagram of an object or organism next to an actual photograph.
- Display a picture while showing a series of questions or factual notes on a second screen.*

Adjacent visuals allow for multiple examples to be shown, raising the possibilities to learn relationships, perspectives, and comparisons, possibly creating a multidisciplinary approach to the subject at hand.

*John B. Haney and Eldon J. Ullmer, Educational Media and the Teacher (William C. Brown Co., Publishers, Dubuque, Iowa), 1970, p. 102.

II. TWO MEDIA PROJECTS FOR AN EIGHTH-GRADE CLASS

Paul Ellis

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II. TWO MEDIA PROJECTS FOR AN EIGHTH-GRADE CLASS

INTRODUCTION

The report that follows constitutes a review of two projects I tried in my eighth-grade core class during the year I participated in the Sedro-Woolley environmental education workshop. During core class time, two periods, the students work in English and Social Studies. Throughout the time allotted to these two projects, the making of an animated film and the production of a light show, I used the entire block of class time. This longer time span was great; we were really able to get into things. Throughout our work we had many occasions when the class bell rang and everybody was surprised. We were so absorbed in what we were doing that the bell was an annoyance. The projects were so much fun for my students that many other students wanted to transfer into our class; they wanted to be where the action was.

These environmental education projects have convinced me of many things: First, that "work" and "play," generally thought of as separate pursuits, can combine as a learning experience; that is, with a good teacher or project manager, the classroom can become an environment where play becomes work toward learning. In the future I am going to examine more and more play situations in the classroom that are successful learning situations. I would define a play situation here as one in which the students are doing something which they enjoy, something they do not lump into the burdensome category of work.

Two kinds of testing and measurement apply to projects such as the ones we worked on. The projects result in a product which gives concrete evidence of what we have done or are doing, in this case the film itself

or the light show, in their various stages of completion. The projects are also a process, and as such are harder to measure, but I think the majority of my students learned cooperation with others, self-awareness, and self-reliance; they learned to contribute as members of a group and their creative abilities were challenged. At the conclusion of such projects, the whole class shares in the sense of accomplishment.

Assigning conventional A, B, C grades was difficult. I tried to grade on individual contributions or degree of effort, but those things alone are not the whole story. Since the whole class helped, didn't they all pass? If individual students don't contribute fully, perhaps it is because the teacher is not always aware of their need to be channeled to another interest. Any student can "succeed" if he can communicate and if the teacher is aware of his problems.

LET'S MAKE A MOVIE!

Movie making is an exciting exchange of energy and knowledge. The teacher need not have too much experience handling a camera or background in filmmaking. This was the first time I had ever handled a camera but it seemed obvious to me that we could do it. If the teacher is positive and energetic about the project, problems can be minimal.

Why make movies? I have some thoughts about this. Communication can occur on many levels and through different media. This is a familiar idea, but putting the idea into practice requires going beyond the traditional classroom structure and format. Ninety per cent of human perception is linked to eyesight. One is engaged primarily through his

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visual sense when he views a film. I wanted to increase the students' perception so I decided to concentrate on an end-product that would appeal primarily to the visual sense and secondarily to the aural sense.

A movie can show the students how different media work and how different levels of expression can be achieved, and in addition can have a "moral" or serve as a lesson to other people and can satisfy their projections and desires. So we decided to make a movie.

"I have seen things and felt things I never knew or felt before and yet at the same time it is fun." This is a quote from a student on our production team. The class developed a sense of unity and loyalty to the group. Identification was great. The students really enjoyed the theme of the movie. One student even felt that the movie "simplified the ecological problem," and may have "formed the beginning of some solutions." This young man has hit upon a truth. A major part of the solution to the environmental crisis lies with today's students. What the students will do in the future and the way they will see their environment is closely related to the things they learn now, the values they adopt, and the attitudes they form.

The idea of making a movie struck me when I saw a short, three-minute animation that had been made by two amateurs. The theme was of an environmental nature and really struck home. As I mentioned earlier, my feelings about classroom goals were linked to perception. I wanted to create a learning environment that would stimulate the environmental perception of my students.

When I first thought seriously about the film project, I had not

talked with my students about educational environments, primarily because at this time (early January) I did not really know what I expected or what I could create myself. I knew I needed to give my students a sense of environmental awareness and I knew it would be desirable if this awareness could be measurable. I planned to evaluate by means of assigned short papers, class discussions, and by what I could identify as a sense of involvement.

My first step in involving the class was a two-hour walk (luckily taken on a sunny, brisk day). The goal of the walk was simple enough: I wanted to remove the students from the rigor of classroom routine and free them to the extent that they would be more receptive to my ideas. When we arrived at "Big Rock," we all sat down and looked out over the Skagit Valley in all directions. I completely bypassed comments on litter, air pollution, or water pollution. I wanted the students to feel a unity with the living scene. My comments were limited to pointing out plants, animals, and other things which were, in their various ways, beautiful.

Upon returning to the classroom I gave a short lecture on "What Is an Experience?" This statement was used so that I could focus on the single fact that we had all done something together. We had all in a general sense seen the same things. We had all generally felt the same freedom. Obviously this varied because of the myriad personalities and the different levels of perception involved, but I emphasized class unity in this experience. A short paper was assigned, the title of which was "Why I Would Like to Spend More Time Outdoors." These papers were read, commented upon, and handed back the next day for rewriting and

amplification.* The next step was to lecture on entropy. I explained how energy flowed through our environment and how all aspects and members of that environment are made from the same building blocks. I emphasized the positive fact that we are all one with nature and our world. When these ideas were out, we pursued them in class discussion. Unfortunately, this discussion actively involved only a few students, but everyone seemed to be listening.

Following this activity, these lectures, and our discussions, which required three hours of class time, I had my students look at our immediate environment. We discussed life support systems--air, water, natural resources, and others--and we followed by discussing man's needs from these life support systems. Conjunctive on the second day I discussed men's desires. Needs and desires raised a critical point, and a lot of students became very defensive about what they desired versus what they needed. But when I pointed out, for instance, how the population problem was a vector pushing outward on increasing desires, they all saw the effect this was having on the life support systems. It was at this point that I began bringing in negative material: air pollution, noise pollution, water pollution, and other problems. A student, I am firmly convinced, will not become aware or change his attitudes until he sees that man's life style is a denial of life support systems, and must necessarily change to be in balance with them.

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*I am not sure the rewriting worked so well because many students were frustrated. They said, "I've already written everything I have to say," or "What do you mean by rewrite? Do you mean copy over?" These kids have trouble making an experience isolate in their minds, or making a process stand still for evaluation.

Following this discussion we had a free hour where I introduced the idea of making a movie that would express the idea that man's desires overtax his life support systems. Many ideas were bandied about. Suggestions were (1) to make a documentary-type movie that shows how the life support systems are being damaged locally, in Skagit County; (2) to make a movie with live actors and some kind of plot about an environment that is overused and destroyed; and (3) to make an animated movie about an imaginary world, or a character that has trouble in his environment. My head was reeling at the end of this discussion. I knew we had to decide which way to go. I finally selected animation as the best process to use, for several reasons: the uncertain Northwest weather, difficulties with variance in light levels in filming live scenes; and the difficulty in getting to location to shoot scenes. In addition, I have already said that my initial inspiration for making a film came from seeing an animated movie, and I leaned toward this idea as being the most easily accomplished way of making a film.*

We decided our theme--a species that is reliant upon its environment, which has the ability to change the environment, but which has increasing numbers that pollute or destroy the life support systems. This main theme needed a plot. Once again we had a class discussion, and we wrote down all the ideas. Over the weekend I checked these ideas and combined some of them for the plot for our movie. We would create an imaginary character who increases unchecked by his own species on an imaginary planet. Finally the life support systems would collapse and the imaginary species would die off. I sketched out half the plot; that is, I got the

*I knew nothing about movie making, especially animation, but I found the process to be quite simple when I studied it for awhile.

imaginary character into the script, and got his world started.

I then had to lecture the kids on how the earth started, how simple forms of life developed, and how man developed and set himself apart. This was essential for their understanding in creating a symbolic world. I made up the name of the species and the characters, and then gave students paper and told them to draw what they thought a Gurkle (the imaginary species) should look like. At the conclusion of the drawing we voted on the basic design for our Gurkle. At this time the students added their ideas to the plot to create a more complex statement. The idea of finding the film giving the history of the Gurkles floating in space erased the need to have our Gurkle talk in its own language; that is, we state that the movie was edited and a script deduced from the action portrayed, the exposed film having been discovered floating in outer space.

The class then really got into full swing. Drawing paper was obtained and a size selected for standard scene units. I divided the class into small groups with two to four members in each group. No one was assigned to stay in his group; fluidity was allowed. Nevertheless no one changed groups after the second day of drawing. Every morning I wrote on the board what was needed and what scenes had progressed to what point (remember, only half of the plot was written at this stage). Volunteers were assigned to needed scenes. As our scenes were assembled, the students saw which fit together. A classroom "style" developed; that is, all the Gurkles began to look alike, as they should for proper continuity, all homes looked alike and the scenes blended together no matter who was working on them. This amazed me and made me proud that we were working so well together as a unit and that our product was standardized.

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I then finished the second half of the plot. The idea of "slurg," a substance basic for survival, without which Gurkles die, was an idea that substantially lowered the difficulty of symbolizing life support systems. Also, at this time we realized that a movie can establish its own frame of reality that will be accepted by the audience. This necessity for suspension of disbelief freed us to the degree that we could in our movie create the sense of reality we wanted.

A student in Shop created some of the hardware we would need for our shooting sequences. He constructed an easel that sat neatly on a table and I brought a lamp from home which could be twisted and turned to reflect upon the scene stand. Finally, I brought the camera we used, a Bolex Super 8 Model 155,* an excellent camera automatic in all functions. No one can fail with this type of camera. I let the students pass it around for a whole period. I did not explain how it worked or what we needed. This undisciplined approach was great. Their curiosity really became intense. Also, they figured out how it worked that day by pressing buttons and looking through it. The zoom lens was a great experience in itself. The next day I explained with a diagram how cameras in general work and how our particular movie camera worked. I explained the function of all the levers and buttons on our camera, even though some of the students had already discovered this for themselves.

On the second day a problem arose: one of the students dropped and broke the camera. Repair took one week and cost $25.00. This put us behind in our shooting and made me suddenly apprehensive about the whole project. I wasn't sure that such equipment should be available to

*The price of a Bolex Super 8 Model 155 is approximately $300.00.

the students. But I still remembered the excitement of the first day when the students played with the camera and figured it out. This day alone was worth the $25.00 risk.

Shooting order was arranged by two students. Then the groups took turns arranging the scenes. Good cooperation occurred, and there was a real sense of unity and accomplishment. After completing the shooting we turned the film in for developing.

A new difficulty arose. The class had been free to work on this film for three weeks and after their work was done the time lag between completion and development bothered them. There was no alternative but to wait, however. When the film returned, I showed the reels unedited. The class then spent two hours deciding what to edit and what music to use as background.

I edited the film myself with the help of a friend with experience in filmmaking. He showed me the process of splicing, which was not difficult, only time-consuming. The students could have done the editing themselves, but at this point in our project it would have taken too long, since we had experienced the delay due to the camera's being broken. The boys in the class who wanted to make the sound track were dismissed from class to work on the sound tape. This took them three to four hours and we were forced to make the tape over because of the poor quality of the recorder we were using. Finally, I brought the three boys to my house one evening and we made a master tape, which was easily done in an hour and a half on my recorder. We then coordinated the tape with the film. If we desire, we can send the film back to the laboratory to have a master film with a sound strip made; we then can record onto the sound strip.

I think movies are a marvelous opportunity for a class and a teacher to grow together in a process of learning. Too much control by the teacher may stifle the creative aspect of the experience. The whole atmosphere must be free, happy, and warm. Problems must be solved by both students and teacher. The teacher helps to create the atmosphere by being positive and completely open to student ideas. If he is not, an exchange will not occur. The atmosphere provides the opportunity for an "experience" to occur. Completion of the production does not end this experience for it becomes part of everyone who is involved.

Many kinds of learning occur during the production of a movie. Filmmaking as a learning experience helps to achieve the following:

1. Challenges the imagination. Students think of new ideas and new ways of stating them. They are stimulated by the ideas of their fellow students.

2. Builds organizational abilities. The students learn to organize their acts toward completion of a project and learn to organize finished segments of the film into a whole. They learn to establish their own timetable and conform to it, to avoid bogging down the entire production.

3. Develops a sense of creativity. The student sees his idea take form and sees it expressed in real terms; he grows in knowing he can create.

4. Transforms reality. The students begin to understand the use of symbols in expressing real situations and are exposed to the idea of another kind of reality--the literary "reality" of the film on its own terms.

5. Develops a sense of cooperation. Students learn to work together and cooperate all along the way.

6. Builds self-awareness. The students' senses are stimulated during the process of filmmaking.

7. Develops problem-solving abilities. The group (including the teacher) identifies and overcomes problems in pursuit of completion of the task.

I sincerely hope that other teachers will look into filmmaking as

a learning device. Hopefully, libraries and schools will be able to afford the cost of good cameras, both still and movie types, and good sound recorders. Quality equipment is not really necessary in filmmaking, but it is a lot more satisfying.

HOW'D YOU LIKE TO MAKE A LIGHT SHOW?

When my class had finished the movie I felt that I wanted to work further in the general area of visual perception. After I saw a movie of a successful program in Boston which employed light shows, I knew I had stumbled across a great idea. I really think this is one of the best activities to come along, especially in secondary education.

I introduced the class to the idea of a light show indirectly, by first talking with them about educational environments. We had a discussion about what they would like in an educational environment. (I have to admit that my eighth graders generally didn't have any ideas that were too definite on this matter.) Two feelings dominated. They wanted to deal with real problems in our troubled world--and they wanted to play. This was the opportunity I used to suggest making a slide show. "What type of slide show do you want to make?" I asked them. "Oh! Of the Skagit Valley--our environment. The good and the bad." I agreed, and also asked them what we would do with the slide show when we had it made. "Show it to other classes," they said. They had suggested that we create an educational environment and invite others to share it. I really felt good about this.

I went to Rick Chace, a filmmaker at a local TV station, and told him I needed slides of the region. He gave me 150 slides that depicted the beauty of nature in our area, as well as the pollution of the life

support systems. I removed 20 of the more negative slides. We ended up with around 120 slides with 80% of them stressing natural beauty. I showed these slides to my class, which took a couple of hours. The class liked the slides, so we set out to collate them for a show.

The idea of using music to accompany the show excited the students. They knew that using music with the slides would expand our educational environment. I set up a stereo system in the classroom, and I brought records from home, as did they. We listened to music with the slides and found songs with themes that supported the photographs.

Meanwhile, I bought ten cellophane report covers in various colors at a cost of five cents each. I obtained an overhead projector and set up a screen. Then I took an ordinary piece of paper and cut out a geometric pattern resembling a snowflake design, set up the slide projector, and focused on the screen. The kids were extremely curious at this point, some even yelling, "Hey, what are you doing?" I then turned on the music and the class began to see. I asked two students if they would mind changing the slides while I played on the overhead. At this point the classroom became somewhat chaotic; everyone wanted to get to those projectors. While the music played, we put the colored cellophane over the lights, changing the whole scene. Right away everybody saw we could achieve an almost unlimited variety of effects using geometric patterns and colored cellophane on an overhead, with the slide projector going in and out of focus with the music. Everyone got a turn at the slide projectors that day. (Only one boy was reluctant to participate. I recalled that he worked in the library, so I put him in charge of procurement of all A-V equipment, which is stored in our library. The boy jumped at the chance for

accepting this kind of responsibility. A side note: I guarantee that all your students, no matter what kind of class you have, will be eager to help and participate in some way in developing a program of this sort, even recalcitrants like this young man.) The kids loved putting the show together; they never did see it as "work." It was pure pleasure.

I have hinted before that a teacher engaged in a project of this nature must be willing to forego classroom control. You, as a teacher, must relax; if you have forgotten how to play, force yourself. Any disagreements over equipment, scissors, or what not, I almost ignored. After about two such incidents, everything calmed down and the students stopped coming to me with petty gripes. My function during this whole experience was as coordinator, though occasionally I had to take a firm hold on the group so we wouldn't waste our time.

After three days of playing music and flashing slides with pulsating geometric forms we really had a show together. One side problem was the noise level. Also, whenever a student could get out of his own class, he came to our room; all the curious congregated there. In addition, some of the students said to their teachers, "Why can't we do something like that? This caused a certain amount of surface animosity on the parts of some of the other teachers. Members of my class united; they knew they had something good going and they wanted to invite the whole school to see our show. We discussed this at length and the students decided they did not want to leave our classroom and set the show up elsewhere. They felt they had created an educational environment there and that it belonged in the place we had created it. (Figure 4 is a diagram showing how we set up the room for the show.)

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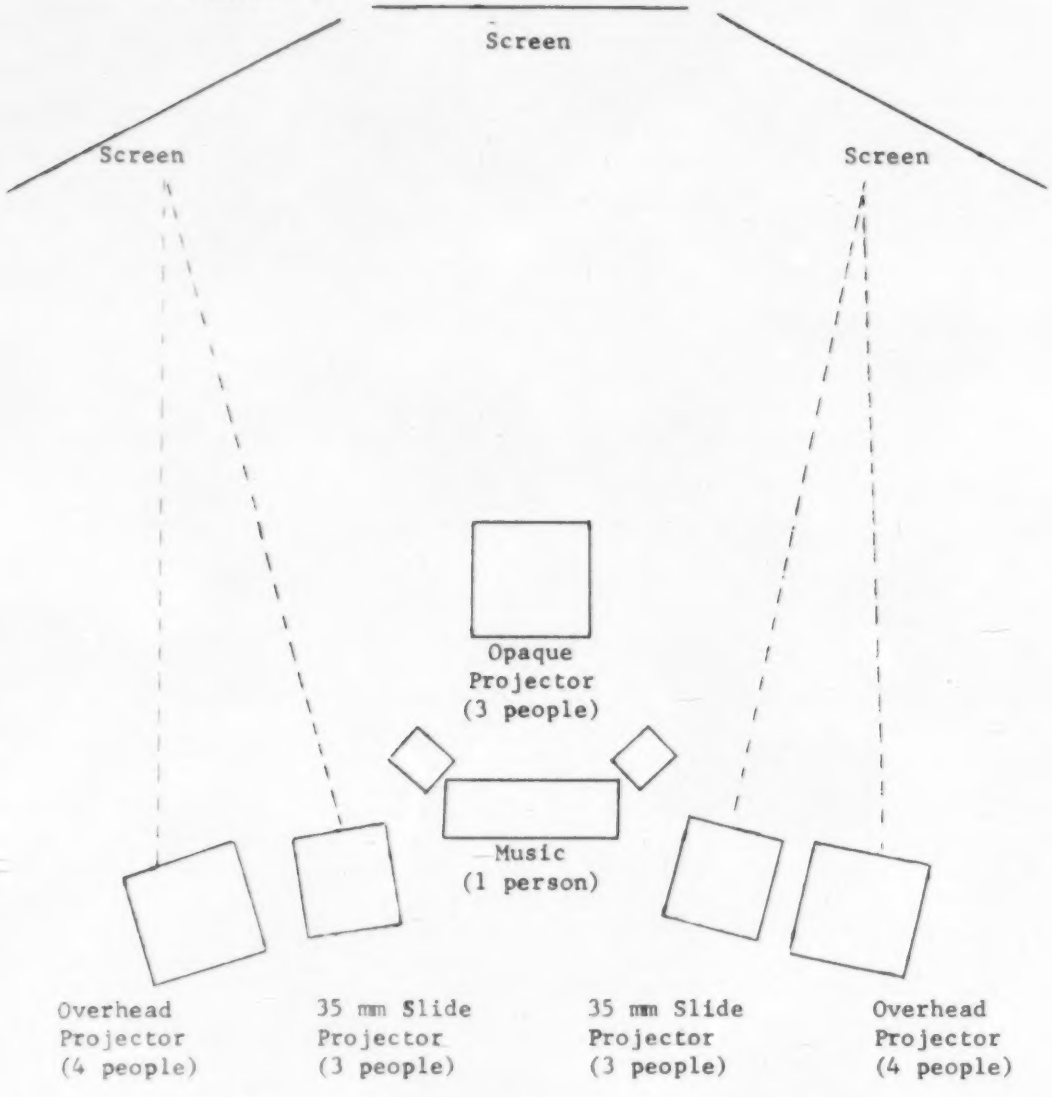

Figure 4. Plan for a light show. (Teams of four students to each overhead projector meant that everybody in the class had a task.)

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The class decided to invite another class to our show. We kept the show down to 35 minutes so that the visiting class could have the remaining 15 minutes for discussion. We wanted the show to be a catalyst for classroom discussion. The show overwhelmed the students; many of them couldn't describe exactly what it was that they had seen, but they were excited by it. They saw a combination of beauty and ugliness.

When we had given this presentation we discussed presenting shows for other classes and other grade levels. These presentations did not materialize, but in the Spring the school Music Department presented a program and my class was invited to run a light show.

There is a whole field of research involved in educational environments, but there are some ideas that I think are essential:

1. The "experience" is a process and must be viewed as a process. Some times you might want to merely "freeze" an experience and use it as a springboard to other kinds of learning.

2. Reality must be adhered to. Students see their environment as a real one, no matter how it may appear to an older person. I want my students to have a positive view of reality, i.e., a good environment. A slide program developed as we did it is a step in this direction.

3. Students must be given better problem-solving techniques. I think the environmental crisis is so acute that we as educators should forego some things we have stressed in the past, replacing them with new study areas in problem solving. These study areas must be interdisciplinary and initially there must be a heavy concentration on environmentally positive values, so that as the children grow the values they have formed don't have to be altered so quickly that there is a risk of real psychic damage.

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